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ABSTRACT

Historical studies reveal that mathematics has been claimed as a private domain by men, while studies of the popular press document that women and girls are considered incompetent in that field. The study of gender and mathematics as viewed through feminism can create a new reading which exposes hidden assumptions, unwarranted conclusions, and questionable practices. Today efforts are underway to entice young women to study mathematics and to convince them that the discipline is not restricted to males. It may be more appropriate, however, to acknowledge reality and work to change it. Consciousness-raising could be invoked to help young women see how the media and traditions have helped promote the separation of women from mathematics. Mathematics education research must abandon the search for single solutions to complex multidimensional problems. The study of gender and mathematics can offer much information regarding the working and functions of sex and gender in society. Combining feminism with the knowledge created in two decades of mathematics education research into questions of sex differences and gender equity may yield many insights and new directions for educational research and change. (AIM)

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Genders, Mathematics, and Feminisms

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This paper was presented at the annual meeting of the American Educational Research Association (New Orleans, April, 1994), as one of five papers in the Research on Gender and Mathematics Symposium titled Perspectives and New Directions. The paper was previously published in the NCRMSE Research Review, a publication of the Wisconsin Center for Education Research. It is reprinted here with permission.

Although all feminist research and theorizing begins with the goal of improving the lot of women in the world, feminism is not singular in its underlying assumption, beliefs, methods, and goals. Instead, diverse feminist work within a range of perspective and frameworks--liberal feminism, socialist feminisms of several sorts, radical feminisms, black womanist theories, and postmodern feminism among them. Most recent research in gender and mathematics is carried out under the assumptions and using the methods associated with liberal feminism which assumes (basically) that the larger structures (e.g. capitalism, the scientific establishment, educational systems) and concepts (e.g. nature of mathematics, literacy as essential, civilization) of current society are stable, essential, and appropriate. Liberal feminist "work within the system," attempting to improve the lot of women within a society which is otherwise left unchanged. Other branches of feminism seek to change the ways in which we understand how the system operates.

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Sociological studies of women in engineering and related fields of mathematically based work reveal a high level of sexism in the workplace.

The work in which I and several others are engaged is an effort to bring the insights, findings, and theories of feminisms other than liberal feminism to bear on our understanding of gender and mathematics. Because this work is characterized by a multiplicity of approaches and the circulation of conclusions which are always already tentative and suspect, I hesitate to claim the term "paradigm" for it. Like new paradigms, however, it does begin with a rupture from the established ways of conceptualizing, conducting, and interpreting research regarding gender and mathematics. I also note that at the roots of this move is a disenchantment with the potential of liberal scientific study to yield solutions to the educational problems and dilemmas of women in relation to mathematics.

The means and methods through which this study is conducted cannot be neatly

characterized as to "methodologies, data gathering, and measurement techniques employed." Like the field of Women's Studies,

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the study of gender and mathematics though the lenses of multiple feminisms is multi-disciplinary; it calls upon approaches and finds of students in many fields ranging from the "hard sciences" to cultural studies and the arts. Just as Women's Studies approach to the study of family might bring together research from sociology, social work, human ecology, medicine, population studies, literature, and religion, a feminisms-based study in the area of gender and mathematics might bring together research and scholarship from sociology, educational measurement, history of mathematics in the U. S., studies of the representation of mathematics in popular literature, mathematical biographies of great mathematicians and of young students, philosophy of mathematics and other fields. New data may be gathered from persons, documents, or cultural artefacts, chosen in light of the existing discourses and interpreted to yield new "stories" related to the topic of study. The multiplicity of studies, findings, and stories are read in relation to feminist theory and "against the grain" of each other and of the dominant discourses of gender and mathematics. The purpose is to create a "new reading" of the dominant discourse, a reading which exposes hidden assumptions, unwarranted conclusions, contentious implications, paradoxes, questionable practices, and, most importantly, interesting questions.

Consider, for example, a feminist analysis of the belief that "math is a male domain." Historical studies reveal that mathematics has long been claimed by men as their private domain and that philosophers have frequently argued justifications for this claim; mathematicians' biographies often make strong masculinist claims about the demands of the field. Sociological studies of women in engineering and related fields of mathematically based work reveal a high level

Taken together and read in light of feminist thought, these findings lead to the conclusions that as a socially constructed area of activity, mathematics is indeed a male domain. In contrast, applications of educational and psychological research treats the belief among women that math is a male domain as a personal attribute, indeed a defect. . .

of sexism in the workplace. Studies of science journalism uncover differences in the representations of scientist (presumed male) and of female scientists which suggest a paradox implicit in the very idea of a female scientist. Similarly, studies of the popular press document that women and girls are frequently presented as incompetent in mathematics and as aliens in that domain.

Feminisms

Even reports of equivalent mathematical performance by the sexes are couched in language suggesting the maleness of mathematics. Taken together and read in light of feminist thought, these findings lead to the conclusions that as a socially constructed area of activity, mathematics is indeed a male domain. In contrast, applications of educational and psychological research treats the belief among women that math is a male domain as a personal attribute, indeed a defect insofar as it interferes with the desired behavior, i. e., pursuing mathematical skill. Based upon this research, educational efforts are launched to convince young women that mathematics is not restricted to males.

The current goal of enticing individual young women to the study of mathematics would be replaced by a goal of claiming for all women the right of entry to and recognition within the domain of mathematics.

In effect, curricula designed and implemented to change this belief, ask young women to overcome and/or deny the social realities around them. Would it not be more appropriate to acknowledge that reality in instruction and work to change it? Feminist traditions of consciousness raising could be invoked to help young women see how the media, as well as familial and other attitudes, promote the separation of women from mathematics. The current goal of enticing individual young women to the study of mathematics would be replaced by a goal of claiming for all women the right of entry to and recognition within the domain of mathematics. This change would move women's claim to the right to mathematics

Feminist critiques and approaches to science suggest critiques of current research and new paradigms in which the experiences of women are more central to the study of gender and mathematics

education into the traditions of claims by women to the rights to economic independence, to many areas of employment, to support for research on women's health, and to many other rights. In gaining each of these rights, education of women to recognize social issues (i.e. consciousness raising) and education of the general public have been critical. The question, researchable through traditional methods, becomes would it work?

This is but one rather simple example of the ways in which an investigative approach grounded in feminisms might change our understanding of gender and mathematics. Virtually all concepts, practices, and assumptions of mathematics education are open to examination through these feminist lenses.

Feminist critiques and approaches to science suggest critiques of current research and new paradigms in which the experiences of women are more central to the study of gender and mathematics. What we mean by mathematics itself, and even what we mean by gender are not immune to challenges and reconceptualization from these perspectives.